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**Tiny Assassins**  
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10 Years of Careers in Science



# Tiny Assassins



*These spiders don't build webs to snare their dinner. They use their elongated jaws to stab their prey with venomous fangs.*

Photo by: Jeremy Miller

**A**cademy scientists recently discovered nine new species of assassin spiders, which survive by preying on other spiders.

They may be small, but assassin spiders are among the most dangerous spiders on the planet - from the perspective of another spider, that is. These tiny arachnids in the Archaeidae family are only about 2 mm (less than 1/8 inch) long, but their bizarre fangs and

*This pair of assassin spiders is engaged in a courtship ritual.*



Photo by: Jeremy Miller





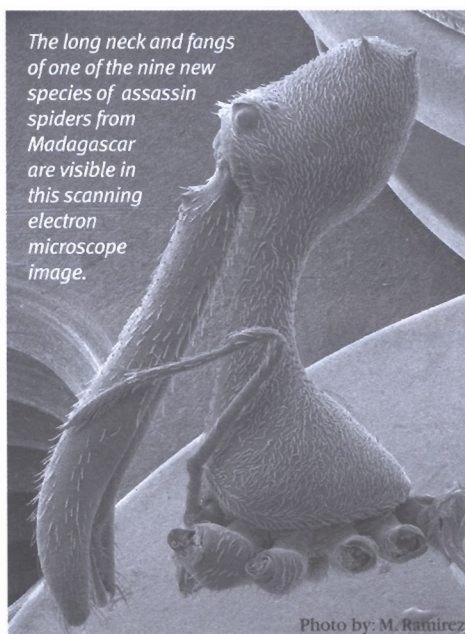
*Hannah Wood is currently observing and collecting assassin spiders in South Africa.*

Photo by: Jeremy Miller.

spider-hunting practices have earned them a reputation as the world's most grotesque spiders.

They hunt by stabbing their prey with venom-filled fangs that are attached to the ends of extremely elongated jaws. These specialized jaws are about ten times longer than the jaws of most other spiders their size. To support these long jaws and prevent them from dragging along the ground, assassin spiders have also evolved elongated necks. The combination allows them to strike their prey without having to approach too closely.

The fossil record shows that assassin spiders were once widely distributed across the planet, but today they are known only from Australia, South Africa, and Madagascar. Until recently, only about a dozen species were recognized. However, nine new species are about to be added to the list, almost doubling the known members of the family. For the past few years, Academy entomologist Charles Griswold and San Francisco State University graduate student Hannah



*The long neck and fangs of one of the nine new species of assassin spiders from Madagascar are visible in this scanning electron microscope image.*

Photo by: M. Ramirez.

Wood have been working to document the spiders of Madagascar as part of the Academy's ongoing arthropod survey of the country. Since the survey was started in 2000, over 2 million arthropod specimens have been processed. Among them, Griswold and Wood noticed a number of tiny Archaeidae spiders that looked suspiciously like new species.

Wood conducted molecular and morphological studies and found that nine new species of assassin spiders were included in the specimens from Madagascar. Surprisingly, the DNA data also revealed that the presence of elongated necks among Archaeidae spiders had evolved at least two separate times. A classic example of convergent evolution, her findings suggest that the need to strike out at prey from a distance encouraged the evolution of extended body parts on more than one occasion.

What type of prey has driven this adaptation? That is a question that Griswold and Wood are now working to answer. Wood just spent several weeks in Madagascar observing assassin spider behavior and is now conducting the same studies in South Africa. Meanwhile, Griswold is searching for assassin spiders in the only other place on the planet that they are currently known to exist - Australia. "Our findings will provide insights into the evolution of feeding mechanisms not just in spiders," says Griswold, "but in animals in general."